

Daily Lesson Plan (DLP)

Topic. How deep does the soil need to be for your crop?		Day :2
Grade: 4-5	Lesson Name: Topic: Research companion planting.	Time : (60 Mins.)

Topic	How deep does the soil need to be for your crop?		
Weekly key words	Dry weather condition, penetrated, cemented, cliché, etc.		
Seating plan	<input type="checkbox"/> Individual	<input type="checkbox"/> Pairs	Group of 4
Skill development	<input checked="" type="checkbox"/> Reading <input type="checkbox"/> Reflection <input type="checkbox"/> Other (Specify)	<input checked="" type="checkbox"/> Writing <input type="checkbox"/> Illustration	<input checked="" type="checkbox"/> Discussion <input type="checkbox"/> Presentation <input type="checkbox"/> Collaboration <input type="checkbox"/> Observation <input type="checkbox"/> Research

Objectives: ➤ The students will be able to:	➤ Learn about the depth of soil ➤ Learn to adjust the depth of soil for germination
Teaching Resources:	Multimedia/projector, laptop, YouTube, writing board, notebook, piece of paper, pen/pencil, plants, worksheet, samples of soil
Teaching Learning Strategies	
<p>Introduction: 5 mins.</p> <p>Initiate the lesson by asking the students to define companion plants along with examples. Take their responses and link them to the topic.</p> <p>Methodology: (20 mins.) Show the following video to the students using a projector, or multimedia. https://youtu.be/dvy0EKaMR0c</p> <p>Let the students discuss the content shown in the video.</p> <p>Depth</p> <p>The effective depth of soil for plant growth is the vertical distance into the soil from the surface to a layer that essentially stops the downward growth of plant roots. The barrier layer may be rock, sand, gravel, heavy clay, or a cemented layer (e.g. caliche).</p> <p>Terms that are used to express the effective depth of soil are:</p> <ul style="list-style-type: none"> • Very Shallow-surface is less than 10 inches from a layer that retards root development. • Shallow - Soil surface is 10 to 20 inches from a layer that retards root development. • Moderately deep - Soil surface is 20 to 36 inches from a layer that retards root development. • Deep - Soil surface is 36 to 60 inches from a layer that retards root development. • Very deep - Soil surface is 60 inches or more from a layer that retards root development. <p>Soils that are deep, well-drained, and have desirable texture and structure are suitable for the production of most garden or landscape plants. Deep soils can hold more plant nutrients and water than can shallow soils with similar textures. The depth of soil and its capacity for nutrients and water frequently determine the yield from a crop, particularly annual crops that are grown with little or no irrigation. Plants growing in shallow soils also have less mechanical support than those growing in deep soils. Trees growing in shallow soils are more easily blown over by wind than are those growing in deep soils.</p> <p>Adjusting planting soil depth for better germination</p> <p>Many producers wonder how this spring's lack of rainfall will affect planting and seed germination. Before performing any tillage operations, producers should inspect the top 6 inches for soil moisture status. If soil moisture is low, producers</p>	

should minimize tillage unless it is absolutely necessary because each tillage pass can cause soil moisture loss of up to a 0.25 inch.

Although subsoil and topsoil moisture status in crop ground is normal in many areas, the National Weather Service has forecast a 60 percent chance of drought in the Corn Belt. Subsoil moisture deficits have been measured, particularly in northwestern and southwestern Iowa, at 5 to 7 inches below optimal levels. Optimal subsoil moisture is 10 inches of plant-available water in the top 5 feet of soil. When topsoil moisture is limited, producers need to use strategies that to help them compensate for this lack of moisture.

Monitor soil moisture by inspecting the top 6 inches for soil moisture status, with either the hand feel method or with gypsum blocks. As mentioned, producers also can save soil moisture by minimizing tillage because each tillage pass releases as much as 0.25 inch of water.

Another option is to use soil conservation practices. No-till, mulch, ridge-till, and strip-till are all effective soil-moisture conservation practices. Avoid cultivation during persisting dry weather conditions and use alternatives such as herbicides for weed control.

Producers who use liquid starter fertilizer should reevaluate this strategy for this season. Application of liquid fertilizer in limited soil-moisture conditions may decrease seed germination by increasing salt concentration around the seeds, thereby minimizing moisture availability to the seeds.

Risk can be reduced with realistic yield goals that reflect production conditions because reasonable yield goals can minimize production inputs. Reduced planting population in seasons when limited soil moisture is anticipated can improve production by reducing competition for limited moisture.

This season, it is very important to control planting soil depth and seedbed. Good seed depth--1.5 to 2.0 inches or even deeper--is recommended in dry conditions to ensure good moisture availability for successful seed germination. Soil texture plays a role in soil moisture availability, especially in the top 6 inches where coarse-textured soils (e.g., sandy loam and loamy fine sand) tend to dry faster than medium-textured soils (e.g., loam, clay loam, silt loam, and silty clay loam).

Producers should realize that although planters have seed population monitors (so seed drop can be checked from the tractor cab), there is currently no monitor for checking seed depth and seed-to-soil contact. As soil conditions change in

different locations or with the weather, it is important that operators check seed placement behind the planter for depth and seed-to-soil contact.

Producers also should calibrate their planters for penetration. Where surface soil is dry and hard, it may be difficult for seed openers to penetrate the surface to an adequate seed depth. Although the operator may have correctly set the depth adjustment, depth wheels may not be firmly in contact with the soil and the planter unit may be riding up on the seed opener. Additional down-pressure or weight is necessary for the seed opener to penetrate to planting depth.

Seed-to-soil contact is usually controlled by coverage and compaction of press wheels and covering discs. Many planters have an adjustable down-pressure spring to vary the amount of surface pressure and coverage for supplying adequate soil contact. Spring pressure may need to be increased in drier surface soil for adequate soil contact and to help bring moisture to the seed. Pressure may be decreased after surface soil moisture has been recharged by rainfall to avoid overcompacting soil around the seed.

Planning for dry weather may be one of the key management challenges producers face this season. Adequate water is especially important at planting time. Without sufficient topsoil moisture, seed germination could be impaired, resulting in low plant populations and low yield.

Activity: (30 mins.) (Group Work)

Instructional goals: Students will be able to: (1) understand the complex nature of soil (components of different layers, and the creatures living in the soil), and (2) see different types of soil including sandy soil, clay soil, and loamy soil.

Duration: 30 minutes

Instructional Materials:

1. Soil samples from 3 uniquely different sites
2. Garden trowel
3. Extension activity: Erlenmeyer flask, funnel, soil samples

Note: Soil samples will work best if they are collected from a deep source so the organic matter; horizon A, and perhaps horizon B are visible (Garbage bags work best.). The activity must be done in autumn or spring.

Wrap up (5mins.): Wind up the lesson by asking the students randomly to share their findings.

Home Assessment:

The students will do the worksheet as homework.

Worksheet

Lesson Evaluation:

- Teacher was able to accomplish all aspects of the lesson well ☐
- Teacher was not able to do warm up activity ☐,
- develop lesson plan well ☐,
- do the learning activity ☐,
- do wrap up ☐,
- accomplish lesson objective ☐,
- manage time well ☐,
- manage class well ☐

Worksheet Day

Name: _____

Topic: Soils

Class: _____

Subject: Science

➤ **Write down any crops with chalky soil, sandy soil, and loamy soils.**
